

Synthesis of Silicon from Rice Husks For Photovoltaic Sells

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Rice production is one of the major food crops in the world and supplies one of the major wastes, called rice husks (RHs). Importantly, the dry RHs contain 75 to 85% organic matter and inorganic remainder which consists of 94–96% silica with small amounts of alkalis and other trace elements. In this work, highly uniform SiO_2 nanoparticles were prepared by combustion method followed by various acids (1N H_2SO_4 , 1N HNO_3 and 1N HCl) leaching of RHs. For silicon powder, the prepared amorphous SiO_2 was further reduced by metallic magnesium in a cylindrical furnace at $\sim 550^\circ\text{C}$ for 10h. The X-rays diffraction (XRD) and IPC-MS revealed that the extracted silicon powder exhibited very high purity of 99.9% with less sodium, magnesium, potassium, calcium, and iron (100–200 ppm), boron, aluminum manganese, and titanium (~ 50 ppm) impurities. Importantly, phosphorus was not detected in the silicon powder.